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## **Abstract**

This paper estimates the aggregate effect of government income transfer shocks for a sample of EU countries. The new measure of transfer shocks builds on a dataset by public finance experts of the European System of Central Banks (ESCB). The identification strategy consists of a narrative analysis of the old-age pension-related policy actions reported in the ESCB dataset. Increases in old-age pensions are found to have a positive impact on aggregate expenditure components and employment consistent with a multiplier effect of between 0 and 1.

**Keywords:** transfer payments, public pensions.

**JEL classification:** E2, E62, H55, I38.

## Resumen

En este trabajo se estima el efecto agregado de *shocks* a transferencias de renta gubernamentales para una muestra de países de la UE. La nueva medida de *shocks* a las transferencias utiliza una base de datos elaborada por expertos en finanzas públicas del Sistema Europeo de Bancos Centrales (SEBC). La estrategia de identificación consiste en un análisis narrativo de las medidas en política de pensiones de vejez recogidas en la base de datos del SEBC. Encuentro que aumentos en pensiones de vejez tienen un impacto positivo en componentes del gasto agregado y en el empleo coherente con un efecto multiplicador entre 0 y 1.

**Palabras clave:** transferencias de renta, pensiones públicas.

**Códigos JEL:** E2, E62, H55, I38.

# 1 Introduction

The economic and financial crisis of 2007/2008 has revived interest in the macroeconomic effect of public expenditures. As the recent crisis unfolded automatic stabilizers responded and public finances deteriorated in many industrialized countries. This was particularly problematic for European economies and called for the adoption of austerity measures since 2010. Both fiscal stimulus and austerity programmes include important public expenditure measures, specifically government income transfers. The recent average total public expenditures as percentage of gross domestic product (GDP) for the EU is around 44%, and social transfers account for more than 65% of this figure. Within social transfers, transfers other than in kind have a larger share than transfers in kind, i.e. 55% and 45% respectively.<sup>1</sup> However, the question of what is the aggregate effect of government income transfers shocks has received comparatively little attention in the literature. This paper contributes to the existing literature estimating the aggregate effect of government income transfers shocks using a panel dataset of 22 EU Member States over the sample period 2007-2015. Specifically, I estimate the multiplier effect and the response of aggregate expenditure components and labour market indicators to changes in old age pensions.

Empirical evidence on the subject is scarce and has focused on the effects that changes in income have on private consumption expenditures. In the framework of the permanent income hypothesis, Poterba (1988) estimates that a \$1 increase in transitory income due to the U.S. tax rebates of 1975 raised spending of non-durables and services by about 12 to 24 cents. Wilcox (1989) finds that a predictable 10% increase in U.S. social security benefits raises durable goods purchases by 3% in the same month. More recently, Romer and Romer (2016) construct a series of

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<sup>1</sup>Average for 2006-2015. Oh and Reis (2012) document the composition of the increase in public expenditures between 2007 and 2009 for the U.S. and arrive at a similar conclusion.

legislated increases in social security benefits in the U.S. from 1951 to 1991 and study the effect of innovations to their narrative variable on private consumption. They find that permanent benefit increases have a significant impact on consumption upon impact. This paper complements parallel work in Párraga-Rodríguez (2016) and extends Romer and Romer (2016) work along two dimensions. First, the set of outcome variables includes output, aggregate private consumption, investment, and several labour market indicators. Moreover, like Gechert, Paetz and Villanueva (2016), a principal contribution of this research is an estimate for the transfers output multiplier. Like Oh and Reis (2012) I look at a recent sample period. However, while they focus on the expansionary side of fiscal policy actions in the U.S. between 2007 and 2009, my economic unit of reference are European countries and the sample period includes both stimulus plans and fiscal consolidations.

Evidence at the household-level is much more prolific and indicates a positive response of individual spending to increases in government income transfers. Japelli and Pistaferri (2010) offer a good literature review on the subject. Relevant studies include, for example, a pioneering quasi-experimental approach by Bodkin (1959). He looks at the consumption response of WW-II veterans after the receipt of unexpected transfer payments in 1950, and finds a marginal propensity to consume non-durables as high as 0.72. Hausman (2016) also looks at the consumption response of U.S. veterans, but of WW-I, in a natural experiment setting. He finds that within six months of receiving a large bonus in June 1936, veterans spent between 0.65 and 0.75 cents out of every dollar received, and that they spent a large fraction of their bonus on cars, i.e. durable goods. Parker et al. (2013) exploit the randomization in the assignation of Social Security numbers in the U.S. to estimate the effect of the tax rebates of 2008 on households spending. They find that on average households spent about 50 to 90 percent of their stimulus payments on durable goods (also



mainly cars), and about 12 to 30 percent on non-durables consumption goods and services in the quarter of the tax rebate. The estimated spending responses are the largest for low-income, old age and borrowing constrained households.<sup>2</sup> Finally, Stephens (2003) investigates the response of household consumption expenditures to the monthly arrival of social security checks in the U.S. He finds an increase in the amount and probability of consuming food perishables and entertainment the immediate days after receiving the checks. The results are even more significant for those households for which social security transfers constitute their main source of income.

Government income transfer shocks are constructed from a new and confidential dataset by public finance experts from the European System of Central Banks (ESCB). The dataset contains detailed information on public revenue and expenditure policies for several EU Member States. Within government income transfers, the data reports policy actions for old age pensions, unemployment benefits, and a residual category for other transfers. This paper though estimates the aggregate effect of government income transfers shocks using policy actions for old age pensions. This restriction is primarily due to a lack of observations of discretionary changes in unemployment benefits and, the difficult economic interpretation of estimates for other transfers due to the miscellaneous benefits included in this category.<sup>3</sup> The policy actions are reported with annual frequency following standardised questionnaires in the context of regular projection exercises; the data is harmonized across countries. The dataset defines a policy action as any change to legislation which determines benefit entitlements. Furthermore, an interesting feature of this new dataset is that fiscal actions are measured as the difference relative to a benchmark for what fiscal policy can be considered neutral. The ESCB dataset compiles discretionary changes in fiscal policy.

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<sup>2</sup>Johnson et al. (2006) study the effects of the 2001 tax rebates with similar findings.

<sup>3</sup>Other transfers include benefits such as family/children, sickness, exclusion, disability, and housing, or health-care related transfers.

The challenge for any study of the aggregate effect of fiscal shocks is the potential endogeneity of policy actions. Policymakers take policies for a variety of reasons. For example, during periods of high levels of inflation, governments may increase income transfer payments to guarantee the purchasing power of their beneficiaries. Another example is that in the event of a recession, extraordinary measures may be needed to help a growing number of unemployed. Then, on many occasions fiscal policy measures are responding to the current state of the economy. The key identifying assumption to produce unbiased estimates of the aggregate effect of transfers shocks is that discretionary changes in government income transfers are exogenous. The ESCB dataset records discretionary changes in transfers. A contribution of this paper is to reclassify these discretionary changes as either exogenous or not exogenous based on their motivation. To do so I use information contained in the descriptions accompanying all measures in the ESCB dataset. I complement this information with several other sources, including country-specific legislation and government reports, country reports by different international organizations, and the occasional newspaper.

I find a multiplier effect between 0 and 1. The estimated old age pensions output multiplier is 0.5 upon impact, with a maximum accumulated response close to unity. Consistent with the existing literature (and household-level evidence) I also find a larger effect on durable goods consumption than non-durables or services. The response of investment is comparable to that of durables consumption. Moreover, increases in transfers have a positive though modest impact on employment. To gain insight into these results, estimates are also broken down by main motivation behind the policy actions and for three geographic regions, i.e. North, South and East Europe. Estimates breaking down policy actions by main motivation indicate similar positive aggregate effects. Regarding regional estimates, I find that the point estimates are only statistically significant for South Europe. Nevertheless, estimates by region highlight that pooled estimates recover the average effect of transfers shocks in EU Member States.

An estimate of the transfers multiplier effect is crucial for assessing the effectiveness of fiscal policy actions. A multiplier effect between 0 and 1 indicates limited effectiveness of fiscal actions involving government income transfers. However, this limited effectiveness might not have the same implications for stimulus and austerity programmes. For example, the results indicate that increases in old age pensions might be costly stimulus measures given their modest positive impact. On the other hand, desirable austerity programmes should include measures that effectively reduce the government deficit while having a contained negative effect on the real economy.

The remainder of the paper is organised as follows. Section 2 describes the ESCB dataset and the construction of the new measure of transfers shocks. Section 3 gives details about the specification used for estimation. Section 4 explains the main results in terms of the multiplier effect and investigates the transmission mechanism of transfers shocks. Section 5 breaks down the estimates by motivation and economic region. Section 6 offers concluding remarks.

## **2 A New Measure of Transfers Shocks**

A contribution of this paper is to construct a new measure of government income transfers shocks. To do so I apply the narrative analysis pioneered by Romer and Romer (2010) to a new dataset compiled by public finance experts from the European System of Central Banks (ESCB).

### **2.1 The ESCB Dataset**

The ESCB dataset compiles discretionary changes of fiscal policy. The dataset defines a policy action for old age pensions any change to legislation which determines

benefit entitlements. Moreover, policy actions are measured as the difference relative to a ‘neutral policy’ benchmark for what policies can be considered to follow the standard development. The benchmark for adjustments of pensions is to report the measures in deviation from the price index of reference, once controlled for the evolution of beneficiaries. The benchmark for reforms is a hypothetical counterfactual of no change in the legislation. A measure due to a reform is defined as the difference in expenditure from what this would have been absent the change in the legislation. It is assumed that the dynamics of the item would have been flat, or the same dynamics as in the previous year. Table A2 in the appendix summarizes the policy actions and methods reported in the ESCB dataset by Spain. The table includes the source, motivation, and description for all policy actions. Morris and coauthors (n.d.) provide more examples for other countries. The estimates reported in the ESCB dataset are based partly on official/external sources and partly on estimates by the members of the public finance group. Estimates were produced whenever the impact of a measure was not available, properly specified or the actual macroeconomic and/or demographic situation deviated significantly from the assumptions made by the external source.

The EU Member States covered in this paper are Austria (AT), Belgium (BE), Bulgaria (BG), Cyprus (CY), The Czech Republic (CZ), Germany (DE), Spain (ES), Finland (FI), France (FR), Greece (GR), Hungary (HU), Ireland (IE), Italy (IT), Luxembourg (LU), Latvia (LV), Malta (MT), The Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), and Slovakia (SK). The ESCB dataset is not publicly available though and this paper cannot disclose data by country. The sample period spans from 2007 to 2015, both years inclusive. This constitutes a panel dataset with 22 countries over 9 years. The ESCB dataset records policy actions as the impact compared to previous year budget and expressed in millions of national currency. To have a consistent variable across Member States, the variables used for estimation are converted to millions of euros of 2015 and expressed in per capita terms.

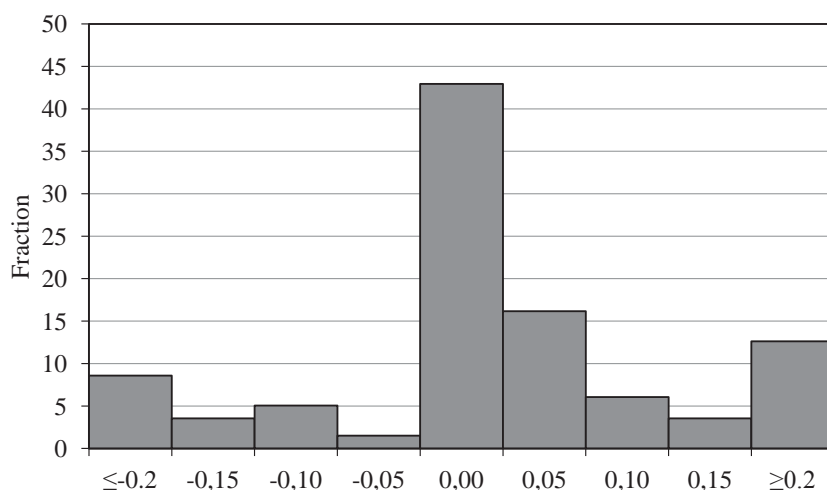


Figure 1: Histogram of All Changes in Old Age Pensions

*Notes:* Measures as percentage of previous period nominal GDP. All countries, 2007-2015.

Panel data offers regression analysis that the short time dimension of the dataset rules out by country. Although the sample period is admittedly short, the sample of countries and time period covered presents a rich amount of variation, essential for adequate regression analysis. Figure 1 shows the heterogeneity present in the sample with a histogram covering the entire sample of countries over the period 2007-2015. The measures range from less than -0.2 to more than 0.2 of GDP. Around 43% of the observations are zero. However, there are also a significant number of nonzero observations; there are more pension increases than pension cuts.

The sign variation of the measures might reflect particularities of the sample period. During the first years we find a number of measures taken as the result of the generalization of the economic and financial crisis to the EU Member States. Since 2010, the EU Member States have implemented austerity programmes to deal with inherited fiscal deficits, and to improve the confidence in their economies to reduce borrowing costs. In some countries, long-run issues such as demographic trends or an ageing population have also been dealt with. On the other hand, we also find increases with an ideological motivation or as means to improve the welfare insurance to vulnerable groups and individuals with low income through the sample period.

As explained earlier in the text, a number of fiscal policy actions can be argued to be systematically related to the current state of the economy. In contrast, the identifying assumption to produce unbiased estimates of the aggregate effect of transfers shocks is that discretionary changes in old age pensions are exogenous. The ESCB dataset records discretionary changes in transfers relative to a ‘neutral policy’ benchmark. In other words, the compiled fiscal actions directly account for developments in GDP, inflation, or more generally, the level of economic activity. The next step is to identify the discretionary fiscal actions motivated by factors other than a systematic response to the current state of the economy.

## 2.2 Narrative Analysis

The ESCB dataset also contains a description for all measures. The descriptions are a valuable source of information about the motivation behind the transfers changes. Whenever the descriptions are too short or imprecise, I complement this information with the narrative record. Among others, I consulted country-specific legislation and government reports; several papers and reports on behalf of the European Commission; and country reports by the IMF and the OECD. Occasionally, I also consulted news from sources such as The Wall Street Journal or The Economist. A full list of all complementary sources for the narrative analysis can be found in the Appendix. The narrative analysis reclassifies the discretionary changes as either exogenous or not exogenous assigning them to one of the following categories:

- *Cyclical*: This category includes changes in transfers consequence of current macroeconomic developments. For example, changes in transfers to promote short-run economic growth or to compensate for a tax hike or other public expenditures cuts. Deficit reduction actions are also classified as cyclical when they respond to short-run movements in the deficit or to offset another shock.

- *Reform*: The most clearly exogenous reforms are policy actions to deal with demographic trends, or an ageing population. Following Cloyne (2013), this category also includes deficit consolidation actions to guarantee the long-run sustainability of public finances that were taken independent of the current macroeconomic situation. ‘Reforms’ also include policy actions imposed on policymakers by external bodies such as European rules or court rulings. I also include reforms for efficiency gains such as combining different transfers into a unique benefit, or to avoid incorrect receipt of benefits from those who actually do not meet the eligibility requirements when they are not a clear consequence of current macroeconomic developments.
- *Purchasing Power*: policy actions aiming to maintain and improve the purchasing power and living standards of beneficiaries. Includes those changes that, according to the established rule for adjustments, change transfers above or below the price index of reference. Also includes discretionary changes in transfers, usually targeted to low-income individuals, with the desire to increase the insurance provided by the welfare system. In other words, changes in transfers with an ideological motivation of fairness.<sup>4</sup>

‘Endogenous’ changes include policy actions motivated by cyclical reasons or within a package of opposing fiscal measures. Changes motivated by the desire to maintain the purchasing power of beneficiaries or due to a reform could be considered exogenous. Romer and Romer (2016) consider exogenous the changes in U.S. social security benefits to keep up with past inflation, to increase the insurance provided by the Social Security programmes, or due to computational mistakes. Compared to them, my reclassification also includes changes in transfers motivated by a structural reform or due to an ‘external’ imposition. Moreover, the reclassifi-

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<sup>4</sup>Initially I broke down ‘Purchasing Power’ into changes motivated to keep up with inflation, and changes motivated by the desire to increase the safety net of the social security. There were too few observations per category though to have meaningful variables. Moreover, it could be argued that the ultimate goal in both cases is to maintain and enhance the living standards of beneficiaries.

cation follows a conservative approach that may over-classify the fiscal actions as countercyclical. While reducing the accuracy of the point estimates, this is done on the basis of obtaining unbiased estimates. From a total of 177 changes, I find 44 ‘endogenous’ changes and 133 ‘exogenous’. Within the later, 59 changes were motivated by purchasing power reasons and 74 were the result of a reform.

Table 1: Predictability Tests

|             | Output | Inflation | Unemploy-<br>ment rate | ALTR | Primary<br>surplus |
|-------------|--------|-----------|------------------------|------|--------------------|
| All changes | 0.28   | 0.68      | 0.23                   | 0.36 | 0.47               |
| Exogenous   | 0.38   | 0.88      | 0.19                   | 0.54 | 0.56               |

*Notes:* p-values for Granger causality tests. A shorthand for the aggregate variable is stated at the top. A shorthand for the transfer shock is stated on the left. Regressions include one lag of the transfers shock and the selected aggregate. All regressions include country and year fixed effects. Estimation is by least squares and standard errors are clustered by country. Sample 2007-2015.

## 2.3 Predictability Tests

If exogenous changes were in fact the response to other influences on output growth, it is likely that these discretionary changes could be predictable by proxies for those influences. This section tests this possibility following Romer and Romer (2010) and, Mertens and Ravn (2012) strategy.

To test whether changes in transfers are predictable, I regress the discretionary changes on their own lag and a lag of output, inflation, the unemployment rate, the implicit Average Labour Tax Rate (ALTR), or the primary surplus. The selected macroeconomic variables aim to capture short-run macroeconomic conditions in each EU State Member. The regressions include country and year fixed effects. Then, I compute the F-test under the null hypothesis that the macroeconomic variables do not Granger cause the discretionary changes in transfers.<sup>5</sup> A high significance level implies that we cannot reject the null. Table 1 shows the p-value for

<sup>5</sup>Standard errors are clustered by country and are robust to heteroskedasticity and serial correlation.



each test. The exogenous changes in old age pensions cannot be predicted by the selected indicators. Moreover, excluding ‘endogenous’ changes improves the tests results for several macroeconomic variables.

### 3 Econometric Framework

This paper estimates the aggregate effect of government income transfers shocks using policy actions for old age pensions. In the context of the Dynamic Linear Panel Regression Model consider the following baseline specification:

$$\ln y_{it} = \alpha_i + \delta_t + \rho \ln y_{it-1} + \beta \Delta T_{it} + \gamma X_{it} + \varepsilon_{it} \quad (1)$$

where the macroeconomic variable of interest  $y_{it}$  for country  $i$  and year  $t$  is expressed in logs. The specification includes a lag of the dependent variable to capture dynamics in the relationship between transfers and the macroeconomic variables.<sup>6</sup>  $\Delta T_{it}$  are the new measure of government income transfers shocks. The transfer shocks measure discretionary changes in old age pensions relative to previous year and are expressed in millions of euros of 2015 and per capita terms.  $100 \cdot \beta$  measures the average percentage increase in a macroeconomic variable of interest caused by a unit increase in old age pensions.  $\alpha_i$  is the unobserved heterogeneity,  $\delta_t$  year fixed effects.  $X_{it}$  is a set of control variables to be discussed below. Finally,  $\varepsilon_{it}$  stands for the idiosyncratic error term.

Under double causality an estimate of  $\beta$  would be biased. The strategy to deal with the potential endogeneity of  $\Delta T_{it}$  consists of applying a narrative analysis to the measures compiled in the ESCB dataset. The new measure of government in-

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<sup>6</sup>Estimation is by two-stage least squares and positions the lagged dependent variable with the second lag of  $\ln y_{it}$ . I verified whether this is sufficient to control for the potential non-stationarity that values of  $\rho$  close or larger than one imply. All estimates are well below unity, and figures 2-4 show stationary dynamics. The inclusion of country fixed effects controls for unobserved heterogeneity, and each dummy is absorbing the effects particular to each country.

come transfer shocks is most likely to satisfy the identifying assumption that transfers shocks are exogenous. First, the ESCB dataset compiles discretionary changes relative to a ‘neutral policy’ benchmark. That is, the measures directly account for short-run macroeconomic developments. Secondly, and most important, the narrative analysis excludes from these discretionary changes those systematically correlated with the current state of the economy.

Specification (1) also includes controls for other influences that might affect both, the outcome variables and transfers changes at the same time but may not be explicitly explained in the narrative record. Alternatively, we can think of the inclusion of control variables as a refinement to guarantee unbiased estimates. First, I include government spending and the implicit ALTR (inclusive of social security contributions) to control for spending in other public expenditures and how discretionary changes in transfers are financed. The Appendix presents results from regressions that use alternative variables to control how discretionary changes in transfers are financed.<sup>7</sup> Secondly, several changes in old age pensions correspond to inflation adjustments. Discretionary changes in transfers are measured in deviation to the standard evolution of prices in each country, but accidental correlation with other factors that affect both, the outcome variables and the changes in pensions due to inflation is always a possibility. Then, it seems important to include the lag of the price level in the regressions.<sup>8</sup> Moreover, the set of controls also includes a proxy for the monetary policy stance. The majority of countries belong to the Euro-area and have their interest rate of reference set by the European Central Bank. However, Slovakia is a Euro area member since 2009, while Bulgaria, the Czech Republic, Hungary, Poland and Romania have their interest rate of reference

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<sup>7</sup>The implicit ALTR is defined as total taxes on employed labour (Eurostat’s series D51A.C1, D29c and D611) divided by compensation of employees (Eurostat’s series D1) plus total wage bill and payroll taxes (Eurostat’s series D29c). Government spending stands for the sum of intermediate consumption, gross fixed capital formation and compensation of employees of the general government (data from Eurostat).

<sup>8</sup>Series from Eurostat, All items HICP (2015=100).

set by their respective national central bank.<sup>9</sup> Finally, under the assumption that changes in international confidence are a common shock to all countries, they are captured in the year fixed effects. Any country-specific fixed deviations from the international sentiment would be captured in the country fixed effects.

The macroeconomic variables of interest are output, non-durables goods consumption, services consumption, durable goods consumption, and private investment. All variables are in real and per capita terms.<sup>10</sup> I also investigate the effect of transfers shocks to selected labour market indicators, which include employment per capita, hours per worker, the unemployment rate and the real wage.<sup>11</sup> The measures of transfers shocks are available at annual frequency from 2007 to 2015. The rest of variables are available from 2005.

## 4 The Aggregate Effect of Transfers Shocks

I start estimating specification (1) for output as the outcome variable. Figure 2 shows the response of output to an increase in old age pensions. Multiplier effects are obtained with a shock to old age pensions equivalent to the value of 1 percent of median GDP in the sample, and normalized by the ratio of GDP-to-old age pensions. The plot also reports bootstrap computed confidence intervals at the 95 and

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<sup>9</sup>Source: international financial statistics (IMF). Euro-area, Slovakia and Bulgaria interest rate of reference correspond to the Central Bank Policy Rate. The Czech Republic and Poland interest rate is the Repurchase Agreement Rate. The interest rate of reference for Hungary and Romania corresponds to the Discount Rate.

<sup>10</sup>Output corresponds to gross domestic product at market prices (Eurostat's national accounts). Consumption aggregates are retrieved from Eurostat's final consumption aggregates by durability at market prices of non-durable goods, durable goods and services. Private investment corresponds to gross fixed capital formation at current prices of the private sector (AMECO series UIGP). Nominal variables are deflated with the HICP base 2015. Variables are converted in per capita terms dividing by total population (Ameco series NPTD). Data last retrieved in April 2016.

<sup>11</sup>Employment per capita corresponds to total Employment (Ameco series NETD) divided by population; Hours per worker correspond to average annual hours worked per person employed (Ameco series NLHA) divided by 52; the unemployment rate corresponds to the Eurostat series *une\_rt\_a*; the real wage is nominal compensation per employee of the total economy (Ameco series HWCDW) divided by the HICP.

68 percent confidence level.<sup>12</sup> Transfers shocks for the baseline specification are the narrative variable including only exogenous changes in old age pensions (black lines).

The estimated multiplier effect for the baseline specification is between 0 and 1. On impact, output rises 0.45 percent. Thereafter, the effect of transfers shocks also includes the effect through lagged output. After one year, about half of the initial effect has faded and the multiplier takes the value of 0.25 percent. After three years the multiplier is statistically not different from zero. An alternative measure of the long run effect of transfer shocks would be the long run cumulative multiplier. This can be calculated as the sum of the impact responses of output until the effect of the shock dies out.<sup>13</sup> The estimated long run multiplier effect is close to 1.

In line with Párraga-Rodríguez (2016), using all discretionary changes overestimates the short-run effect of transfer shocks on output (circle marker). Output rises 0.54 percent upon impact, however, the multiplier is not statistically different from zero by the third year. The resultant long run multiplier effect is slightly above unity and takes the value of 1.1 percent. The sign of the bias suggests a positive correlation between the state of the economy and changes in old age pensions. Estimates that use all discretionary changes could be attributing to increases in transfers what in reality would be the result of concealed factors associated with better financing capacity. The estimates do not differ significantly though. This could reflect the pre-treatment of policy actions in the ESCB dataset because policy actions are measured relative to a ‘neutral policy’ benchmark.

<sup>12</sup>Robust standard errors to heteroskedasticity and serial correlation are clustered by country. The confidence interval for the impact responses are equivalent to adding or subtracting 1 or 2 standard deviations. Thereafter, confidence intervals are computed from 10,000 draws of  $\beta$  and  $\rho$  from a bivariate normal distribution with mean and covariance matrix equal to the point estimates and covariance matrix of the regression coefficients.

<sup>13</sup>Formally,  $m = \sum_{t=0}^{\infty} \rho^t \beta = \frac{\beta}{1-\rho}$ , where  $m$  denotes the long run multiplier.

As a robustness check, I also present estimates for an alternative measure of the shocks based on the residuals of regressing all discretionary changes in transfers on a constant and a lag of output (gray line). That is, the alternative measure of transfer shocks removes predictable responses to output from the discretionary changes in transfers. The point estimates for this alternative measure are below the baseline estimates the entire forecast horizon. Output increases 0.40 percent upon impact, and the long run multiplier effect is 0.6 percent. However, the differences are not statistically significant either.

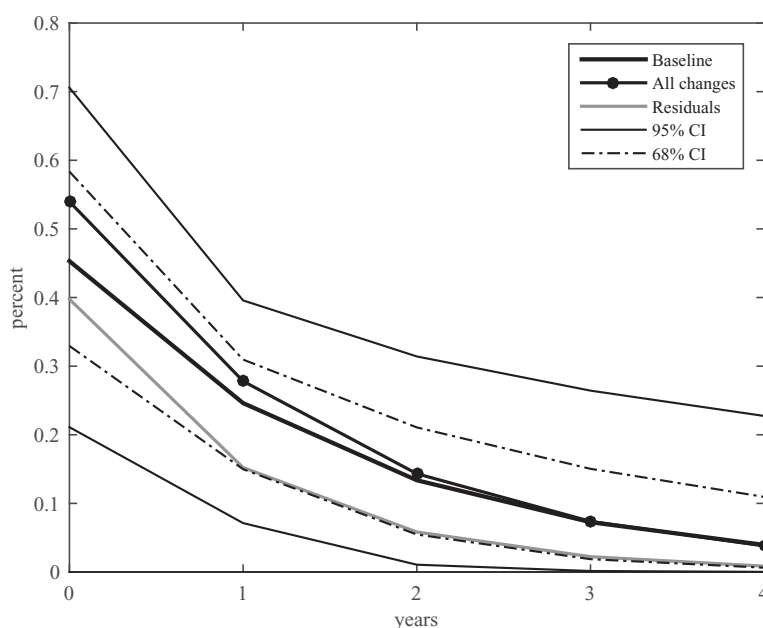


Figure 2: Dynamic Response of Output to Transfers Shocks

*Notes:* Response to an increase in old age pensions equivalent to 1 percent of GDP. Transfer shocks are the narrative variable including only exogenous changes (black), all changes (marker), or residualized (gray). Full lines are point estimates; thin and broken lines indicate one and two standard deviations confidence intervals respectively.

At this point it is imperative a comparison with other estimates of the multiplier effect in the existing literature (although these measures do not afford a one-to-one comparison in all cases). In parallel work I estimate the dynamic aggregate effect of innovations to social security benefits in the U.S. during the period 1951-2007. There I find an impact multiplier of 0.2, which rises to an accumulated response of

1.0 after four quarters and reaches a maximum value of 2.2 in the long run. With the same methodology, Gechert, Paetz and Villanueva (2016) estimate a multiplier effect of shock to social security in Germany between 0 and 1. Gechert, Paetz and Villanueva (2016) point out that the different estimates for U.S. and European data could be due to a higher ratio of imports-to-GDP in Europe compared to the U.S. Other comparable estimates are those for the tax multiplier. The following estimates are based on U.S. data. In the SVAR tradition and for total tax revenues, Blanchard and Perotti (2002) find a peak multiplier of 0.8. Using sign restrictions in an SVAR framework, Mountford and Uhlig (2009) also estimate the effect of aggregate taxes and find an impact multiplier of 0.3, which rises to 0.9 after one year and reaches a maximum value of 3.4 after twelve quarters. Romer and Romer (2010) construct a narrative variable of legislated tax changes in the U.S. and estimate that a tax hike of 1 percent of GDP has a small and not statistically significant effect on output on impact, but maximum effect of 3.1 percent after ten quarters. Mertens and Ravn (2013) estimate the proxy SVAR for personal income taxes and find a multiplier of 2.0 on impact, rising to a maximum of 2.5 in the third quarter. Finally, Ramey (2011) literature survey sets the range of estimates for the government spending multiplier from 0.6 to 1.8.

## **4.1 Aggregate Expenditure Components**

Government income transfers affect the macroeconomy through changing the disposable income of households and their spending decisions. Therefore, it is important to study the effect of transfers shocks to different expenditure components to better understand the point estimates for the output multiplier. To this end, the next outcome variables are aggregate private consumption of non-durables, services and durables, and aggregate private investment.

Figure 3 shows the dynamic response of aggregate expenditure components to an exogenous increase in old age pensions. The shocks are scaled to be equivalent to 1 percent of GDP. The plots also report 95 and 68 percent confidence intervals. An increase in old age pensions yields a positive effect on all three aggregate consumption components. The larger response of durable goods consumption, 0.58 percent, than non-durables, 0.33 percent, or services, 0.19 percent, is in line with the existing literature. Evidence at the household-level predicts a larger response of durables than non-durables purchases to increases in disposable income.<sup>14</sup> Moreover, Romer and Romer (2016) and Párraga-Rodríguez (2016) find that innovations to social security benefits trigger a larger response of durables purchases than non-durables consumption in the US. However, the estimates for durables and services consumption are only significant at the 68 percent confidence level and transfer shocks have a longer lasting effect on non-durables consumption. On the other hand, private investment rises 0.99 percent upon impact. Standard theory of the effect of public expenditure shocks predicts crowding out effects. However, unlike government spending, transfers do not compete directly with private spending. Government income transfers indirectly affect aggregate demand through redistribution. Moreover, this strong response of investment is in line with other estimates of the response of investment to tax shocks (see Romer and Romer 2010). The estimates though are also imprecisely estimated; confidence intervals are wide on impact and, thereafter, the point estimates are not significant at the 95 percent confidence level.

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<sup>14</sup>See, for example, Parker et al (2013, 2006), Souleles (1999).

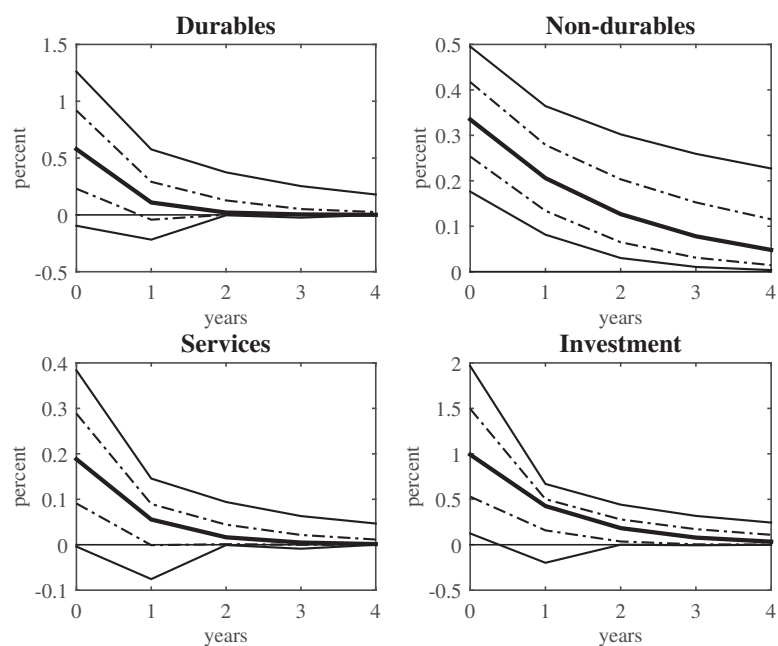


Figure 3: Dynamic Response of Aggregate Expenditure Components to Transfers shocks

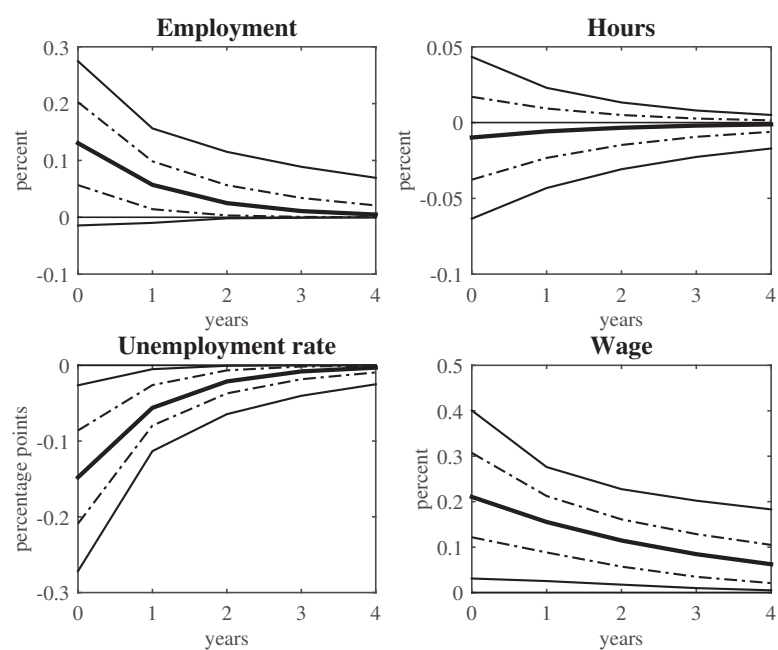


Figure 4: Dynamic Response of Labour Market Indicators to Transfers Shocks

*Notes:* Response to an exogenous shock to old age pensions equivalent to 1 percent of GDP. Full lines are point estimates; thin and broken lines indicate 68 and 95 percent confidence intervals respectively.



## 4.2 Labor Market Indicators

Evidence on the aggregate effect of public expenditures shocks to the labor market is scarce and has focused on the effect of government spending shocks.<sup>15</sup> As an exception, Romer and Romer (2016) estimate with US data the effect of permanent increases in social security benefits on employment. This section complements parallel work in Párraga-Rodríguez (2016) and extends the outcome variables to include hours per worker, the unemployment rate, and the real wage. The labour market indicators represent the extensive, intensive margins of labour, and a measure of labour costs.

Figure 4 shows the dynamic response of the selected labour market indicators to an increase in old age pensions. The shocks are scaled and equivalent to 1 percent of GDP. The plots also report 95 and 68 percent confidence intervals. An increase in old age pensions has a positive effect on employment and the unemployment rate. This is consistent with the point estimates for the output multiplier and aggregate expenditure components. On the other hand, the response of hours is virtually zero and not significant. The estimates also indicate that increases in transfers are wage inflationary. The real wage rises 0.21 percent upon impact and the response is quite persistent. Overall though, and like Romer and Romer (2016) or Párraga-Rodríguez (2016), the size of the estimates is modest or imprecisely estimated.

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<sup>15</sup>See Monacelli et al (2010), Ravn and Simonelli (2007), Chodorow-Reich et al (2012) and references therein.

## 5 Estimates by Motivation and Different Regions

### 5.1 Different Motivations

The narrative analysis has highlighted the different motivations for transfers changes. The criteria used to reclassify the discretionary changes in transfers established three main motivations: changes in transfers motivated by cyclical conditions, due to a reform or, aiming to sustain and improve the living standards of their beneficiaries. Transfers changes in the last two categories are considered exogenous. Reforms include policies to guarantee the long run sustainability of public finances, for efficiency gains or as a result of an external imposition on policymakers. ‘Purchasing power’ measures include those changes that, according to the established rule for adjustments, change transfers above or below the price index of reference. This category also includes changes with an ideological motivation of fairness or equity. However, changes associated with structural reforms usually involve transfers cuts while changes to improve the purchasing power of the beneficiaries usually involve increases. As a result, we might expect different effects from discretionary changes by motivation. This section investigates whether this is the case.

Table 2 presents the results. To help in the comparison, I reproduce again estimates for the narrative variable which includes exogenous changes due to both motivations. The selected dependent variables summarize the aggregate effect of transfers shocks and include output, total private consumption expenditures, private investment, and employment per capita.<sup>16</sup> Again, the coefficients correspond to the effect of an increase in old age pensions equivalent to one percent of GDP. Robust standard errors are in brackets and clustered by country. Comparing the second and

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<sup>16</sup>Total aggregate consumption corresponds to the sum of non-durables, durables and services consumption.

Table 2: The Aggregate Effect of Transfers Shocks by Motivation

|                  | Output         | Consumption    | Investment     | Employment     |
|------------------|----------------|----------------|----------------|----------------|
| Purchasing Power | 0.55<br>(0.56) | 1.01<br>(0.40) | 2.13<br>(0.93) | 0.38<br>(0.22) |
| Reform           | 0.46<br>(0.14) | 0.21<br>(0.08) | 0.89<br>(0.48) | 0.11<br>(0.06) |
| All Exogenous    | 0.45<br>(0.13) | 0.29<br>(0.11) | 0.99<br>(0.49) | 0.13<br>(0.07) |

Notes: A shorthand for the dependent variable is stated at the top of each column. A shorthand for the transfers shocks is stated on the left. The regressors include the lagged dependent variable, instrumented with the second lag. All regressions include country and year fixed effects; also include controls for monetary and tax policy. Estimation is by two-stage least squares and standard errors are clustered by country. The sample period is 2007-2015.

third row in Table 2, the baseline point estimates are close to estimates which only include ‘reform’ changes. This indicate that the baseline estimates might be mainly driven by changes due to reforms. On the other hand, estimates for ‘purchasing power’ changes have large standard errors. This imprecision though could be partly attributed to the lower number of observations in this category. Nevertheless, once accounted by the larger standard errors for the ‘purchasing power’ category, the point estimates for either motivation indicate similar positive aggregate effects.

Table 3: Multiplier Effect by Region

|                 | Baseline       | South          | North          | East           |
|-----------------|----------------|----------------|----------------|----------------|
| Impact effet    | 0.45<br>(0.13) | 0.25<br>(0.03) | 0.00<br>(0.30) | 0.43<br>(0.79) |
| Long-run effect | 1.0            | 0.8            | 0.0            | 1.0            |

Notes: A shorthand for the region is stated at the top of each column. The regressors include the lagged dependent variable, instrumented with the second lag. All regressions include country and year fixed effects; also include controls for monetary and tax policy. Estimation is by two-stage least squares and standard errors are clustered by country. The sample period is 2007-2015.

## 5.2 Different Regions

This section relaxes the assumption of a single slope coefficient in specification (1) and presents estimates for the output multiplier in different regions. Pooled estimates measure the average effect of transfer shocks in EU Member States. However, the sample of countries presents differences like the degree of openness, the share of social expenditures or the number of retirees per capita that might affect the multiplier effect of transfers shocks. I establish three regions in line with EuroVoc's definition of sub-regions in Europe. A Northern or continental region for AT, BE, DE, FR, FI, LU, NL. A Southern or Mediterranean region formed by CY, ES, GR, IT, PT, SI. The remaining countries form an Eastern European region: BG, CZ, HU, LV, PL, RO, SI, SK.<sup>17</sup>

Table 3 compares the multiplier effect across regions caused by an identical increase in old age pensions in all regions. The shock to transfers is scaled to be equivalent to the value of 1 percent of median GDP, and normalized by the ratio of GDP-to-old age pensions. To help in the comparison I reproduce again the baseline estimates for the pooled sample. The multiplier effect is the strongest in East Europe, while it is virtually zero in North Europe. The point estimates for these regions though have large standard errors and should be interpreted with caution. On the other hand, the output response is statistically significant for South Europe. An increase in old age pensions triggers a lower impact effect in South Europe compared to the baseline, however, the shock is more persistent and the resultant long-run multiplier effect of 0.8 is similar to the baseline estimates.<sup>18</sup>

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<sup>17</sup>IE, and MT are excluded due to a lack of variation in discretionary changes for old age pensions.

<sup>18</sup>As described earlier in the text, long-run effects are computed as the sum of output responses.

## 6 Conclusions

This paper has provided evidence on the aggregate effect of government income transfers shocks using a panel dataset of 22 EU Member States during 2007-2015. A contribution of this paper is the construction of a new measure of transfers shocks based on a dataset by public finance experts of the ESCB. The ESCB dataset records discretionary changes in old age pensions relative to a ‘neutral policy’ benchmark. A narrative analysis reclassifies these discretionary changes as either exogenous or not exogenous, i.e. a systematic response to the current state of the economy, according to their motivation.

A principal contribution of this paper is an estimate for the output transfers multiplier. The estimated old age pensions output multiplier ranges between 0 and 1. I also find a positive and significant effect of transfers shocks to aggregate expenditure components. On the other hand, the estimates indicate a positive though modest effect on the labour market. Estimates were also broken down by main motivation behind the policy actions and for three geographic regions, i.e. North, South and East Europe.

Finally, these results have important policy implications. A multiplier effect between 0 and 1 indicates limited effectiveness of fiscal actions involving transfers. However, this limited effectiveness might not have the same implications for stimulus and austerity programmes. On the one hand, the results indicate that increases in old age pensions might be costly stimulus measures given their modest positive impact. On the other hand, desirable austerity programmes should include measures that effectively reduce the government deficit while having a contained negative effect on the real economy. To draw stronger conclusions a larger panel either in terms of time span and/or number of countries seems the most promising way.

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## A2 Policy Actions in Spain

Next table summarizes the source, motivation, and description for all Spanish policy actions reported in the fiscal questionnaires between 2007 and 2015. The implementation year and descriptions are directly taken from the fiscal questionnaires; all remaining information builds on the data reported in the questionnaires.

| Year | Source  | Policy action   | Motivation       | Notes and Methodology   |
|------|---|---|------------------|---|
| 2007 | General State Budget Law 42/2006, 28 December | Improvement in minimum pensions, with an increase of 4.5% if the pensioner has a dependent spouse, 3% if he/she does not and 1 point for SOVI (compulsory old-age and disability insurance) pensions. These in addition to a 2% increase corresponding to the expected change in the CPI.   | Purchasing power | The benchmark for indexation of pensions is the rate of CPI inflation from November t-1 to November t. A measure is defined as the legislated pension increases above (below) this benchmark, multiplied by total expenditure in t-1. Minimum pensions have more often a final adjustment (including deviations of the expected change in the CPI from realized inflation) that deviate from the rate of CPI inflation. |
| 2008 | General State Budget Law 51/2007, 26 December | Improvement in minimum pensions, with an increase of 6.5% if the pensioner has a dependent spouse, 5% if he/she does not, and 22.3% if the pensioner is a widower with family obligations. 1% increase of SOVI pensions above the expected change in the CPI.   | Purchasing power |   |
| Year | Source  | Policy action   | Motivation       | Notes and Methodology   |
| 2009 | General State Budget Law 2/2008, 23 December  | Improvement in minimum pensions, with an increase of 3% in addition to the increase due a deviation of the forecast from real inflation in the previous year. The rise is equivalent to additional 15 euros per month to minimum pensions for pensioners with dependant spouse, and pensioners that constitute a single economic unit of survivors, retirement or disability pensions. Guaranteed purchasing power to other pensioners with an increase of 2%, together with an increase due to a deviation of the forecast from real inflation in the previous year. | Purchasing power | The benchmark for indexation of pensions is the rate of CPI inflation from November t-1 to November t. A measure is defined as the legislated pension increases above (below) this benchmark, multiplied by total expenditure in t-1. Minimum pensions have more often a final adjustment (including deviations of the expected change in the CPI from realized inflation) that deviate from the rate of CPI inflation. |

| 2010 | General State Budget Law 26/2009, 23 December | Improvement in minimum pensions, with an increase of 2% on average for all minimum pensions from the Social Security and SOVI. The increase is equivalent to 15 euros per month for pensioners with dependent spouse or that constitute a single economic unit. | Purchasing power |   |
|------|---|---|------------------|---|
| 2010 | Royal Decree-Law 8/2010, 20 May               | Withdrawal of transitory regime for partial retirement  | Reform           | The benchmark is the hypothetical counterfactual of no change in the legislation. The measure is defined as the difference in expenditure from what this would have been absent the change in the legislation. Estimation from official source. Policy action due to an external imposition: “[...] speed, security and determination in action is part of the commitment of the member countries of the euro zone to strengthen confidence in the single currency and the stability of the euro zone.” |
| Year | Source  | Policy action   | Motivation       | Notes and Methodology   |
| 2011 | Royal Decree-Law 8/2010, 20 May               | Pensions freeze.  | Reform           | Legislation implies measures to reduce the public deficit due to an ‘external’ imposition: “The measures outlined require the adoption of a legal rule. The need for immediate application in some cases, to ensure their effectiveness in reducing spending, and its realization, knowledge and security in other, so that their credibility and immediate effect on financial transactions and the relevant actions to guarantee for the stability of the euro [...].”                                |
| 2012 | Royal Decree-Law 20/2011, 30 December         | No adjustment in pensions for the deviation of forecast from real inflation in the previous year.   | Reform           | Measures to reduce the public deficit due to an ‘external’ imposition: “Spain was granted an additional year, until 2014, to bring the deficit below 3% also modifying the deficit targets of the intervening years. This concession did not mean at all a relaxation but, on the contrary, a tightening of fiscal consolidation efforts” (Stability Programme 2013-2016).  |

|      |   |  |          |   |
|------|---|--|----------|---|
| 2013 | General State Budget Law 17/2012, 27 December | Increase of pensions above CPI, with an increase of 1% for all pensions. | Cyclical | Percentage increase retrieved from the presentation project of the General State Budget. Increase in compensation for no adjustment due to a deviation of expected change in the CPI from real inflation in the previous year. In a press conference, 30th November 2012, vice-president Soraya Senz de Santamara said: “We are well aware that you cannot ask all pensioners the same effort and that we must discuss the matter [no adjustment in pensions] with fairness, hence, in January 2013 pensions will be increased, in general, 1 percent, but 2 percent for pensioners who earn less than a thousand Euros.” |
|------|---|--|----------|---|

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### A3 Alternative Controls for Fiscal Policy

Figure A1 presents estimates for multiplier effect and alternative controls for fiscal policy. The controls include the primary surplus (line with marker), and interest payments of outstanding debt (gray line). The primary surplus is defined as net lending/borrowing of general government (Eurostat's series B9) minus interest payments (Eurostat's series D41 PAY). To help in the comparison, black lines reproduce baseline estimates discussed in the main text. Figure A1 also includes estimates without controls for monetary or fiscal policy (thin black line) though all regressions include country and year fixed effects. The differences between coefficients are not statistically significant and range from 0.39 to 0.50 upon impact.

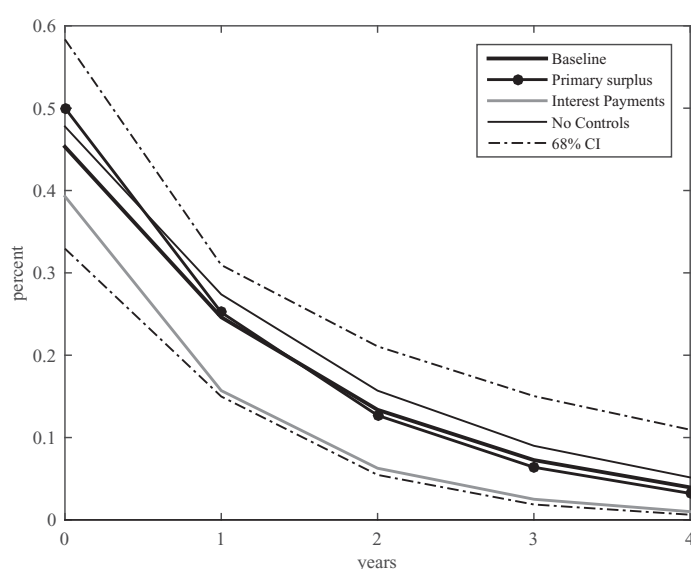


Figure A1

*Notes:* Response to an exogenous shock in old age pensions equivalent to 1 percent of GDP. Full lines are point estimates; broken lines indicate 68 percent confidence interval for baseline estimates.

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